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MINE RECLAMATION'S RELIANCE ON KING COAL: MEETING LEGACY ENVIRONMENTAL OBLIGATIONS WITH A DECLINING INDUSTRY

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Coal mines throughout Appalachia have left the land scarred and the water damaged. Although mine reclamation programs are the only major system of recourse for addressing environmental degradation caused by mining, the downturn of the coal market has put reclamation programs in a precarious position for achieving that end. Funds for coal mine reclamation are derived from the current coal industry's profits. As coal profits continue to atrophy, so too does the pot of money designated for reclamation efforts. These dwindling financial resources are particularly problematic because there is still significant need for reclamation funding throughout Appalachia.

This Comment explores the interaction among the legal and regulatory frameworks for mine reclamation, pervasive degradation of public health and the environment caused by coal mining, and the coal economy's decline. Analysis of this interaction exposes the need for a new system of mine reclamation to remedy the environmental degradation left by legacy coal mines throughout Appalachia. Although environmentalists generally applaud the demise of the coal industry, under the existing regulatory scheme the fall of King Coal may also entail perpetual pollution in the coal fields throughout Appalachia. As such, this Comment proposes ways to move forward and complete reclamation efforts in the age of a withering coal industry.

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INTRODUCTION

> My Great Grandfather spent his days in a coal mine and his nights on the porch in a chair. Now he's in heaven and down here in hell the rivers run muddy and the mountains are bare. Old King Coal, what are we going to do when the mountains are gone and so are you?
>
> – Sturgill Simpson, *Old King Coal*

As you venture toward the Marsh Fork of the Big Coal River in Southern West Virginia, it feels as though you are deep in the heart of immaculate wilderness. Forests engulf you. Streams and waterfalls trickle through every cranny of the surrounding Appalachian Mountains. However, as local resident Junior Walk explains, one only needs to get a view from above for a different story to emerge. "Every main ridgeline around here is mined. There's hardly any ridgeline around here that is untouched."[1]

Junior lives in Whitesville, West Virginia—a town in the center of the Southern West Virginia coal fields—where he worked for the coal industry before devoting his life to fighting mountaintop-removal mining.[2] Junior flies a drone to monitor environmental compliance, which he said has "proven itself to be such a useful tool for documenting [mining pollution]. Down in the hollows and in the valleys, things look so pristine and you can't really see the destruction that's taken place. But you get up above it with a drone and the landscape changes."[3]

As just one illustrative example of this kind of destruction, Junior tells the story of the Edwight Surface Mine, a mountaintop-removal mine operated by Alpha Natural Resources, formerly Massey Energy.[4] This mine is on the mountain directly behind Peach Tree Hollow—a small community a few miles from Junior's home.[5] The mountain was previously called

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1. Telephone Interview with Junior Walk, former Outreach Coordinator, Coal River Mountain Watch (Oct. 9, 2018).
2. *Id.*
3. *Id.*
4. *Alpha Natural Resources,* SOURCEWATCH, https://www.sourcewatch.org/index.php/Alpha_Natural_Resources (last updated May 6, 2016) [https://perma.cc/BLF9-39JK].
5. Telephone Interview with Junior Walk, *supra* note 1.

Cherry Pond Mountain, but "now it is just referred to as Edwight. Nobody really even calls it Cherry Pond anymore."[6] While this mine was operational, it contaminated the drinking water wells of the residents at the base of the mountain.[7] Junior further explains, "The mine closed about four years ago. While they've 'reclaimed' the mine site—meaning that they have put it back to the approximate original contour and thrown some hydroseed on it—it is still ugly as can be and has lots of runoff and sediment problems."[8]

Junior is particularly interested in water pollution issues associated with mining.[9] He describes the reality of the southern West Virginia coal fields by noting:

> The water around here is all the different colors of the rainbow. We had a well when we were growing up. The coal companies started doing coal slurry injection, and our water turned orange coming out of the tap. We had that water for eight or nine years. There is a creek around the mountain that is bright orange—it is as orange as Donald Trump. An older fellow lives over there, and that creek is where he gets his drinking water. Eventually, Massey had to pay for a water treatment system for his place, and that was one small victory we had.
>
> The drinking water depends on whether people are on well water or not. The closer people are to towns, the more likely it is that they have municipal water. But the deeper and further you get back in these hollows, the more likely it is that people are on well water and that the well water may be contaminated.
>
> For drinking water pollution, the biggest factors are coal slurry and acid mine drainage. Those are the main two factors that contaminate people's drinking water. And for acid mine drainage coming off abandoned mines, there is really no recourse for that. The Abandoned Mine Land fund is un-

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6. *Id.*

7. *Edwight Surface Mine*, SOURCEWATCH, https://www.sourcewatch.org/index.php/Edwight_Surface_Mine (last updated Sept. 2, 2012) [https://perma.cc/MV86-CTNG].

8. Telephone Interview with Junior Walk, *supra* note 1.

9. *Id.*

> derfunded and has been continuously chipped away at. If all of the money in it were to go to West Virginia, it still wouldn't be enough. It's not clear where funding for water treatment for these abandoned mine sites would come from.[10]

Coal mining has left southern West Virginia scarred and damaged. Currently, coal mine reclamation programs are the only viable option for addressing the harms produced by coal mining. Yet, as Junior's story suggests, these systems are in a precarious position for accomplishing much-needed remediation.[11]

Coal mine reclamation is the act of restoring a mine site to mitigate some of the negative environmental impacts of operations.[12] Mine sites left unreclaimed promote corollary ills such as water pollution, injury from landslides or unsteady infrastructure, and significant adverse health effects for those who live nearby.[13] To counteract the risks associated with abandoned mine sites, Congress enacted the Surface Mining Control and Reclamation Act of 1977.[14] This law requires each mining company to post performance bonds that ensure reclamation of its operations.[15] Additionally, mining companies are taxed on coal produced to fund the reclamation of historic coal mines that were abandoned prior to 1977.[16] In short, all coal mines have to be reclaimed instead of left to lie dormant and ravaged.[17]

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10. *Id.*

11. Though outside the scope of this Comment, there is a strong argument that the remediation systems themselves are not adequate to cure much of the environmental damage left behind by mines. *Id.* However, this Comment is limited to critiquing the viability of the current coal reclamation systems.

12. 30 U.S.C. § 1202(h) (2012).

13. Letter from Peter Morgan, Staff Attorney, Sierra Club Environmental Law Program et al., to Director Pizarchik, Office of Surface Mining Reclamation and Enforcement (July 20, 2016) [hereinafter Sierra Club et al.], www.sierraclub.org/files/blog/Self-bonding%20comments%20to%20OSMRE_7-20-16.pdf [https://perma.cc/C8QR-9WNV]; *Abandoned Mine Land Reclamation Program*, U.S. DEP'T OF THE INTERIOR: NAT. RES. REVENUE DATA, https://revenuedata.doi.gov/how-it-works/aml-reclamation-program/ (last visited Mar. 17, 2018) [https://perma.cc/9Y5R-TRFJ].

14. 30 U.S.C. § 1201(c), (h) (2012).

15. *Id.* § 1259.

16. *Id.* §§ 1232, 1234.

17. *Id.* §§ 1232, 1234, 1259.

While environmentalists generally applaud the downturn of the coal industry,[18] this Comment will demonstrate that the current system of mine reclamation is premised on the continued production and profitability of coal. Funds for coal mine reclamation are carved out of the current industry's profits.[19] Because the coal industry continues to atrophy, states in Appalachia are not scheduled to receive requisite funds to remediate existing unreclaimed mines.[20] As a result, under present law, King Coal's demise may also entail perpetual degradation of public health and the environment in the Appalachian coal fields.

This Comment is focused on the plight of West Virginia because it highlights not only on-the-ground conditions but also the legal and regulatory hurdles of mine reclamation in Appalachia.[21] In Part I, this Comment discusses the negative environmental and social effects that accompany unreclaimed mine sites. Next, Part II provides an overview of the statutory framework for coal mine reclamation. Then, Part III explores the interaction between mine reclamation and the coal industry's decline. Last, Part IV offers suggestions for restructuring coal-mine reclamation to respond to the decline in coal profitability and ensure that unreclaimed mine sites are not left without recourse.

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18. *See e.g.*, Roberta Mann, *Another Day Older and Deeper in Debt: How Tax Incentives Encourage Burning Coal and the Consequences for Global Warming*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 111 (2007); *Coal and the Environment*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/index.cfm?page=coal_environment (last updated Mar. 23, 2018) [https://perma.cc/9L7W-2UP7].

19. *See* 30 U.S.C. § 1232; *see also* Craig B. Giffin, *West Virginia's Seemingly Eternal Struggle for a Fiscally and Environmentally Adequate Coal Mining Reclamation Bonding Program*, 107 W. VA. L. REV. 105, 185 (2004). Reclamation funds are derived from currently operational coal companies. The distinction between reclamation funds for current mines and historic mines will be discussed in further detail below.

20. *See infra* Part III.

21. West Virginia is the only state that is entirely within the Appalachian Region. "The Appalachian region encompasses the entire state of West Virginia and portions of: Mississippi, Alabama, Georgia, South Carolina, North Carolina, Tennessee, Virginia, Kentucky, Ohio, Maryland, Pennsylvania, and New York." Stephanie Rosser Skeen, *Coal Mine Water Pollution in Appalachia*, 5 APPALACHIAN NAT. RESOURCES L.J. 113, 113 (2011).

I. IMPACTS OF UNRECLAIMED MINE SITES ON SURROUNDING AREAS

Unreclaimed mines are not only a problem for delinquent mine operators. Instead, these sites pose a significant threat to the wellbeing of those unlucky enough to live near them—folks who happen to be some of the poorest in the United States.[22] Any meaningful and well-functioning reclamation system must consider where the burden falls. Otherwise, an already marginalized portion of our society will continue to shoulder adverse environmental and health impacts associated with unreclaimed mines.[23] To emphasize how dangerous and egregious the harms posed by unreclaimed mines are, the reality surrounding these sites is discussed below.

A. Unreclaimed Mine Sites Adversely Impact the Environment

In Appalachia, surface mining has impacted an estimated 1.4 million acres.[24] Surface mining uses dynamite to splinter rock strata so that overburden—meaning the dirt and rocks that once comprised the tops of mountains—can be removed to access the horizontal coal seams.[25] This process pollutes the surrounding water, increases flooding and landslides, and causes significant air pollution.[26]

In West Virginia alone, pollution from abandoned mines has affected an estimated 2,582 miles of waterways.[27] The

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22. *See, e.g.*, Chris McGreal, *America's Poorest White Town: Abandoned by Coal, Swallowed by Drugs*, GUARDIAN (Nov. 12, 2015), https://www.theguardian.com/us-news/2015/nov/12/beattyville-kentucky-and-americas-poorest-towns [https://perma.cc/P7J8-HGDF].

23. Diana Kaneva, *Let's Face Facts, These Mountains Won't Grow Back: Reducing the Environmental Impact of Mountaintop Removal Coal Mining in Appalachia*, 35 WM. & MARY ENVTL. L. & POL'Y REV. 931, 937 (2011); Sierra Club et al., *supra* note 13, at 2–3.

24. Kaneva, *supra* note 23, at 936 (noting that those 1.4 million acres constitute "an area the size of Delaware" and are "home to people and wildlife").

25. Mickey Webster, *Recent Developments in Surface Mining: An Examination of Black Mountain and* Bragg v. Robertson, 15 J. NAT. RESOURCES & ENVTL. L. 267, 268 (2001).

26. Sierra Club et al., *supra* note 13, at 16–17; *Abandoned Mine Land Reclamation Program*, *supra* note 13.

27. Giffin, *supra* note 19, at 107 (estimate based on a study conducted in 1999; the stream miles affected by abandoned mine sites could be increased today due to an additional nineteen years of mining activity).

process of coal mining releases dormant pollutants such as iron, manganese, arsenic, and selenium into streams, rivers, and other water sources.[28] An EPA study determined that, throughout Appalachia, aquatic life in nine out of ten streams located downstream from a surface mining operation suffers "significant impacts" from mining.[29] Moreover, some surface mines push overburden off the mountain to form valley fills, which choke out streams below.[30] The EPA conducted a survey of seventy-eight surface-mine sites that utilized valley fills and determined that seventy-three of those sites "had selenium water concentrations greater than the threshold for toxic bioaccumulation."[31]

Another by-product of coal mining is acid mine drainage, which pollutes water with sulfates, metals, and high acidity.[32] Acid mine drainage affects thousands of stream miles throughout Appalachia.[33] It can render streams unable to support aquatic life and significantly impair their biological carrying capacity.[34] In the event of water pollution from a mining operation, water treatment facilities are extremely expensive to construct and operate.[35] In fact, certain types of mine pollution, like acid mine drainage, can require water treatment indefinitely.[36]

Mining also promotes a host of other harms. For example, the soil disruption and deforestation that accompany surface

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28. Sarah J. Surber, *Writing a Check That the State Can't Cash: Water Pollution from Coal Mining and the Imminent and Inevitable Failure of the West Virginia Special Reclamation Water Fund*, 27 TUL. ENVTL. L.J. 1, 4 (2013).

29. *Id.* at 17 ("Loss of aquatic life biodiversity occurs in up to 2880 miles of West Virginia streams due to 'the propagation of surface coal mining pollutants through the regional river network.' Scientists have documented cranial and facial deformities in fish from selenium pollution. [Surface mine] sites continuously release illegal quantities of [Clean Water Act] pollutants and destroy and impair aquatic life.").

30. Patrick C. McGinley, *From Pick and Shovel to Mountaintop Removal: Environmental Injustice in the Appalachian Coalfields*, 34 ENVTL. L. 21, 66 (2004).

31. Surber, *supra* note 28, at 19.

32. Courtney W. Shea, *Regulating for the Long Term: SMCRA and Acid Mine Drainage*, 10 J. NAT. RESOURCES & ENVTL. L. 193, 194 (1995).

33. *Id.* at 193.

34. *Id.*

35. Surber, *supra* note 28, at 3. In West Virginia, one study estimated that costs for treating selenium pollution alone in streams throughout the state would be between $1.925 to $10 trillion for twenty years of water treatment. *Id.* at 4.

36. Shea, *supra* note 32, at 194.

mines exacerbate flooding.[37] Dynamite blasts from surface mines can be "so strong they crack the foundations and walls of houses" and pollute the surrounding air with particulate matter.[38] As can be anticipated from the conditions described above, these environmental effects also impact the health of those living and working in the coal fields.

B. Unreclaimed Mine Sites Have Adverse Effects on Health

Along with the significant environmental risks associated with unreclaimed mine sites, studies have demonstrated "a clear connection between proximity to surface mines and significant negative health outcomes."[39] Adverse health effects—such as hypertension, chronic obstructive pulmonary disease, kidney disease, cancer, and death—increase "proportionally to coal production."[40] Moreover, these health effects are not limited to those working at a coal mine but extend to those living in proximity to mine sites.[41] This result can be clearly traced to both the water pollution and the air pollution that mines produce.

As Junior illustrated, mining has adversely affected drinking water in the Appalachian coal fields.[42] Mining can deplete wells and contaminate drinking water with pollutants.[43] Both well water and municipal water are contaminated in certain areas, making clean drinking water unavailable for some Appalachians.[44] The effects of consuming mine pollutants through

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37. Kaneva, *supra* note 23, at 937.

38. McGinley, *supra* note 30, at 61.

39. Sierra Club et al., *supra* note 13, at 11.

40. Kaneva, *supra* note 23, at 937; Sierra Club et al., *supra* note 13, at 2–3.

41. Sierra Club et al., *supra* note 13, at 2–3 (quoting M.A. Palmer et al., *Mountaintop Mining Consequences*, 327 SCIENCE 148, 148–49 (2010)).

42. Telephone Interview with Junior Walk, *supra* note 1; Mark Cherry, *Permit to Poison: The Failure of the Federalist Regulatory Regime to Address the Human Health Impacts of Mountaintop Removal Coal Mines*, 47 COLUM. HUM. RTS. L. REV. 198, 223–24 (2016).

43. McGinley, *supra* note 30, at 60.

44. Cherry, *supra* note 42, at 226; Jeanna Heard, *Bankruptcy's Role in the Growing Dilemma of Self-Bonding in the Coal Industry*, 34 EMORY BANKR. DEV. J. 205, 209 (2017); Wilson Dizard, *Coal Mining's Long Legacy of Water Pollution in West Virginia*, ALJAZEERA AM. (Jan. 13, 2014), http://america.aljazeera.com/articles/2014/1/13/coal-pollution-miningwestvirginiamassey.html [https://perma.cc/A3RT-HMNZ]; *West Virginia's Streams Are in Trouble*, APPALACHIAN MOUNTAIN ADVOCS., http://www.appalmad.org/slider/west-virginias-streams-are-in-trouble/

drinking water are serious.[45] For example, selenium, a common water pollutant associated with mining in West Virginia, can cause "deadly kidney and liver damage as well as damage to nervous and circulatory systems."[46] Moreover, water pollution may continue to exist long after mine sites have been reclaimed.[47] Long-term pollution means that persons living near such sites continue to be threatened by adverse health effects well after the mines close, unless reclamation efforts lead to water treatment.[48] Although this Comment focuses on the failure of the current reclamation system to achieve its objectives, there is a strong argument that the current reclamation system, even if fully implemented, is inadequate for preventing and mitigating existing water pollution.[49]

Air pollution from mining poses other serious health risks for those living in Appalachia. For example, miners may develop black lung disease from inhaling coal dust at mine sites.[50] Black lung is characterized by shortness of breath, cough, chest discomfort, and "the expectoration of copious quantities of black, inky sputum."[51] Although black lung was believed to be in decline due to the increased use of surface mining in lieu of underground mining, black lung is now being diagnosed in surface miners throughout Appalachia.[52] Those

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(last visited Mar. 17, 2018) [https://perma.cc/5BZM-URAK] ("More than 40 percent of West Virginia's rivers are too polluted to pass simple water-quality safety thresholds. They are too polluted to be safely used for drinking water or recreation, or to support healthy aquatic life. This is due in large part to pollution from decades of mining. From ongoing pollution from active mountaintop removal mines and toxic discharges from poorly reclaimed mines, the quality of streams of West Virginia has never been more degraded.").

45. *West Virginia's Streams Are in Trouble*, *supra* note 44.

46. Skeen, *supra* note 21, at 114.

47. Cherry, *supra* note 42, at 223–24.

48. West Virginia University Health Sciences Center, *Chronic Illness Linked to Coal-Mining Pollution, Study Shows*, SCIENCEDAILY (Mar. 27, 2008), https://www.sciencedaily.com/releases/2008/03/080326201751.htm [https://perma.cc/VN64-TS25].

49. *See* Kaneva, *supra* note 23, at 937; Telephone Interview with Junior Walk, *supra* note 1.

50. Patrick McGinley, *Collateral Damage: Turning a Blind Eye to Environmental and Social Injustice in the Coalfields*, 19 J. ENVTL. & SUSTAINABILITY L. 305, 388–89 (2013).

51. *Id.* (quoting Greg Wagner, *Black Lung: Anatomy of a Public Health Disaster*, 340 NEW ENG. J. MED. 1770 (1999) (book review)).

52. Howard Berkes, *Surface Coal Miners at Risk for Black Lung*, NPR (July 9, 2012), https://www.npr.org/2012/07/09/156377872/surface-coal-miners-at-risk-for-black-lung [https://perma.cc/FQ5Q-XMYE].

who merely live in coal towns may also experience respiratory diseases from inhaling mine dust, such as silicosis, bronchitis, pneumoconiosis, and emphysema.[53] Whereas the air pollution that causes black lung is prevalent only during mining operations, those affected continue to live with many of these health effects even after the air pollution subsides.

These conditions have swayed many residents to accept buyouts from the coal companies, though the buyouts are frequently too small to cover the costs of moving, buying a new home, and finding work in a different area.[54] As Patricia Bragg, a former resident of a coal camp in Mingo, West Virginia, put it:

> The bottom line, whether they offer you a fair price or not, is why do I have to move? . . . As an American, I can choose where I want to live. If I choose to live in a hollow, call me a hick or a hillbilly, but that's where I want to live.[55]

For those who consider Appalachia home, the environmental and health consequences that accompany the benign act of *living at home* are intolerable.[56] The legacy of coal mining put many Appalachians in the position of "being forced to choose between clean water and the livelihood that puts food on their tables."[57] Poverty in Appalachia also means that those bearing the brunt of these significant health effects may not have adequate access to healthcare.[58] Though still an imperfect remedy for many of these injustices, mine reclamation helps cure some of this inequity by shifting the costs of mining from the folks living in Appalachia to the industry responsible for creating the toxic mess.

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53. Heard, *supra* note 44, at 209.

54. Heard, *supra* note 44, at 210 (discussing how in the buyout of a town in southwest West Virginia, "[i]nstead of helping the community, the occupant coal company at the time, Massey Energy, chose to reduce its liability by simply buying out residents that had lived in Lindytown for generations"); McGinley, *supra* note 30, at 80.

55. McGinley, *supra* note 30, at 80.

56. *See id.*

57. Skeen, *supra* note 21, at 124.

58. Kaneva, *supra* note 23, at 937.

II. OVERVIEW OF THE STATUTORY FRAMEWORK FOR COAL MINE RECLAMATION

In 1977, Congress recognized the serious issues posed by unreclaimed mine sites and enacted the Surface Mining Control and Reclamation Act.[59] This Part discusses how the regulatory system for coal mine reclamation operates and is funded. Understanding this funding structure is important for assessing the effect of the coal industry's decline on mine reclamation efforts, discussed in Part III.

The Surface Mining Control and Reclamation Act (SMCRA) of 1977 was designed to respond to the adverse effects of unregulated surface mining.[60] Through SMCRA, Congress acknowledged the detrimental risks posed by surface mines, including:

> [D]isturbances of surface areas that burden and adversely affect commerce and the public welfare by destroying or diminishing the utility of land for commercial, industrial, residential, recreational, agricultural, and forestry purposes, by causing erosion and landslides, by contributing to floods, by polluting the water, by destroying fish and wildlife habitats, by impairing natural beauty, by damaging the property of citizens, by creating hazards dangerous to life and property[,] by degrading the quality of life in local communities, and by counteracting governmental programs and efforts to conserve soil, water, and other natural resources . . . .[61]

SMCRA requires mine operators to "restore the land affected to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses"[62] and to ensure that the site will not present a threat to public health or water quality.[63] Surface mines must be revegetated and regraded in a way that "approximate[s] [the] original contour of the land."[64] Additionally, SMCRA requires

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59. Pub. L. No. 95-87, Title I § 101(c), (h) (91 Stat. 447-48) (codified at 30 U.S.C. § 1201(c), (h) (2012)).

60. *Id.* § 101(c).

61. *Id.*

62. 30 U.S.C. § 1265(b)(2).

63. *Id.*

64. *Id.* § 1265(b)(3). Mine operators may receive a variance from the original contour requirement, but to qualify, they must meet strict requirements. McGin-

coal companies to minimize degradation to surface and ground water resulting from toxic or acid mine drainage.[65] Congress created the Office of Surface Mining (OSM) to execute SMCRA's statutory mandates.[66]

To accomplish these statutory objectives, SMCRA provides two sources of funding for mine reclamation: the Abandoned Mine Land program for historic mines abandoned prior to 1977 and performance bonds for mines in operation after 1977. This Part discusses the way these programs work—or fail to work—to illustrate the dependence of these programs on coal production.

A. Pre-1977 Mine Reclamation Funding: Abandoned Mine Land

Turning first to the Abandoned Mine Land (AML) program, SMCRA established AML to reclaim and restore "land and water resources adversely affected by past coal mining."[67] Only the lands and waters associated with mines abandoned or unreclaimed prior to August 3, 1977—historic sites—are eligible for funding under AML.[68] AML is financed through fees levied on coal produced by active mining companies each year.[69] Surface mines incur a reclamation fee of twenty-eight cents per ton of coal produced, and underground mines pay a fee of twelve cents per ton of coal produced.[70]

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ley, *supra* note 30, at 58–59 (noting that "to qualify for a variance . . . the [approximate original contour] requirement, SMCRA requires that a mountaintop removal permit applicant propose a postmining land use that falls in one of five specific categories: industrial, commercial, agricultural, residential, or public facility (which includes recreational facilities). In addition, the permit applicant must also prove that the proposed postmining use constitutes an equal or better economic or public use of the affected land as compared to the premining land use.").

65. 30 U.S.C. § 1265(b)(10).

66. 30 U.S.C. § 1211.

67. *Id.* § 1231(c)(1); *Reclaiming Abandoned Mine Lands*, OFFICE OF SURFACE MINING RECLAMATION & ENF'T, https://www.osmre.gov/programs/aml.shtm (last updated June 27, 2017) [https://perma.cc/3CC2-HJAY].

68. 30 U.S.C. § 1234. In 1990, Congress amended AML so that funds could also be put toward post-1977 mines that lost their bonds due to surety insolvency. Post-1977 mines that have lost bonds through self-bond bankruptcies are not, however, eligible for AML funding. Shea, *supra* note 32, at 212.

69. 30 U.S.C. § 1232.

70. *Id.* If 10 percent of the value of coal at the mine is less than the fee levied on each ton of coal produced, then the mine company will only be responsible for paying whichever fee is less. *Id.* "Congress set the current rates when the fee was

SMCRA allocates money from the AML fund to protect public health, safety, and property according to the following order of priorities.[71] First, money is allocated to remediate sites, including adjacent land and water, where there is "extreme danger of adverse effects of coal mining."[72] Second, money is allocated to remediate sites where there are "adverse effects of coal mining," again including land and water adjacent to such sites.[73] Last, SMCRA allocates money to restore land and water resources degraded by coal mining practices, "including measures for the conservation and development of soil, water . . . , woodland, fish and wildlife, recreation resources, and agricultural productivity."[74]

Despite clear statutory objectives to reclaim and restore "land and water resources adversely affected by past coal mining," the statutorily mandated distribution of AML funds makes remediation impossible to achieve.

1. Distribution of Funds Within AML

Even though AML was designed to address the liabilities associated with mine sites abandoned prior to 1977,[75] only 30 percent—nowhere near enough to achieve SMCRA's remediation mandate—of the overall funds in AML go specifically to historic coal sites.[76] The main cause of this shortfall is the statute's "certification" process.

States that have reclaimed all priority 1 and 2 sites—sites with "extreme danger of adverse effects of coal mining" and "adverse effects of coal mining"[77]—are eligible for certification.[78] Certified states receive funding equivalent to 100 per-

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extended in the Tax Relief and Health Care Act of 2006, lowering the rates 20% from the original amounts set in 1977." *Abandoned Mine Land Reclamation Program*, *supra* note 13.

71. 30 U.S.C. § 1233(a).

72. *Id.*

73. *Id.*

74. *Id.*

75. *Id.* §§ 1231(c)(1), 1234.

76. *Abandoned Mine Land Reclamation Program*, *supra* note 13.

77. 30 U.S.C. § 1233(a) (2012).

78. *Abandoned Mine Land Reclamation Program*, *supra* note 13. Currently, five states and three tribes are considered certified: Wyoming, Montana, Texas, Louisiana, Mississippi, the Crow Tribe, the Hopi Tribe, and the Navajo Nation. *FY 2018 AML Grant Distribution*, OFFICE OF SURFACE MINING RECLAMATION &

cent of their contributions to AML from the Treasury General Fund.[79] By contrast, each noncertified state, meaning any state that has not reclaimed all high-priority sites, is allocated just 50 percent of the reclamation tonnage fees on coal produced within the state each year.[80]

Under this scheme, certified states without high-priority abandoned mine sites are guaranteed to get a larger proportion of funding per contribution than those with high-priority abandoned mines.[81] In fact, certified states make no contribution to the AML fund since they get their entire contribution returned. Certified states, despite having no high-priority abandoned mine sites, receive 100 percent of the AML contributions generated by producers operating within their borders, whereas noncertified states receive only 50 percent of the contributions from their producers, even though they have unreclaimed, high-priority abandoned sites. Problematically, many states with the largest number of unreclaimed, pre-1977 mines are no longer the biggest coal producers in the United States.[82] As such, the largest payouts from the AML fund go to the biggest current coal producers each year rather than to the states with the most outstanding abandoned mine liability.[83]

After certified states receive their AML distributions, another 20 percent of the fund is allocated to federal expenditures.[84] That leaves just *30 percent* of the AML fund—a fund created by Congress for the express purpose of remediating historic coal mine sites[85]—available for allocation toward abandoned historic coal sites. That 30 percent is distributed on a state-by-state basis in proportion to the percentage of national coal tonnage produced by each state prior to 1977.[86]

But isn't this structure contrary to the purpose behind the creation of the fund—to clean up mine sites in areas where

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ENF'T, https://www.osmre.gov/resources/grants/docs/FY18GrantDist.pdf (last visited Mar. 19, 2018) [https://perma.cc/N6L2-ZMFY].

79. *FY 2018 AML Grant Distribution*, *supra* note 78.

80. *Id.*

81. *See id.*

82. *Id.*

83. *Id.*

84. *Id.*

85. *Abandoned Mine Land Reclamation Program*, *supra* note 13 ("Congress created Historic Coal grants so that states with large numbers of abandoned mines, but little current coal production, would not be left without funds to reclaim them.").

86. *FY 2018 AML Grant Distribution*, *supra* note 78.

reclamation is needed most? Upon examination of fund distribution from AML to specific states, this query thickens.

2. AML Funds and Appalachia

The AML Program has been largely unsuccessful at aiding reclamation of historic mine sites in Appalachia while nonetheless paying out huge sums to states with little to no unreclaimed historic site liability. The funding disparity between certified and noncertified states is significant, especially in the case of Wyoming. While Wyoming currently produces the most coal and therefore generates the most "funding" for AML—it effectively produces zero dollars in reclamation fees for historic abandoned mine sites because Wyoming receives a 100 percent return on its contribution. This means that the ailing Appalachian coal industry is largely on its own to produce funds that are sufficient to cover the enormous amount of outstanding historic reclamation liability.

For example, in 2018, Wyoming, Pennsylvania, and West Virginia were scheduled to receive the largest grants from the AML program.[87] Wyoming received $91.3 million, Pennsylvania received $55.7 million, and West Virginia received $36.3 million.[88] These funds were calculated based on each state's classification.[89] Wyoming is a certified state, so it receives a grant equal to 100 percent of its contribution.[90] Because Wyoming contributed $44.9 million, it received a "matching" grant of $52.8 million from the treasury general fund, which is totaled and then adjusted to reach $91.3 million for the year.[91]

By contrast, historic coal states in Appalachia are at a disadvantage in the AML funding hierarchy. West Virginia and Pennsylvania are noncertified, historic coal states, so they receive just 50 percent of their contributions along with a grant proportional to the amount of coal that was produced within the state prior to 1977.[92] The pre-1977 coal grant is calculated as a percentage of the 30 percent portion of the AML fund

87. *Abandoned Mine Land Reclamation Program*, *supra* note 13.
88. *Id.*
89. *FY 2018 AML Grant Distribution*, *supra* note 78.
90. *Id.*
91. Note that Wyoming received a payout of even more money than it contributed. *Id.*
92. *Id.*

designated for historic coal sites.[93] West Virginia received $6.5 million from 50 percent of its contribution to AML, along with 19.9 percent of the historic coal allocation, which totals $32.2 million for 2018.[94] In sum, West Virginia received $38.8 million for 2018. Pennsylvania received $3.4 million from its 50 percent contribution to AML, along with 34.6 percent from the historic coal allocation equivalent to $56.1 million for 2018.[95] In sum, Pennsylvania received $59.6 million for 2018. Thus, historic coal states are in a significantly disadvantaged position compared to certified states.[96]

TABLE 1. 2018 payouts from the abandoned mine lands fund.[a]

State	Contribution for the year (millions)	Percent of contribution returned	Historical coal allocation (millions)	Total amount received (millions)
Wyoming	$45	100	$0	$97.8
Pennsylvania	$3.4	50	$56.1	$59.6
West Virginia	$6.5	50	$32.3	$38.8

[a] FY 2018 Grant Distribution, *supra* note 78.

In Pennsylvania, unfunded liability from unreclaimed, abandoned mine sites is $3.9 billion, according to OSM's own calculations.[97] Most troubling, $2.8 billion of that unfunded liability is attributed to polluted water for human consumption.[98] Only 19 percent, or $899 million, of the total outstanding liabilities from unreclaimed mine sites in Pennsylvania have been funded since 1977.[99]

In West Virginia, out of $1.7 billion in total costs for abandoned and unreclaimed mine sites, $1 billion remains unfunded.[100] That means that since 1977, the AML program has only managed to fund 43 percent, or $755 million, of the out-

93. *Id.*
94. *Id.*
95. *Id.*
96. *Id.*
97. *E-AMLIS State and Tribal Summary*, OFFICE OF SURFACE MINING RECLAMATION & ENF'T, https://amlis.osmre.gov/Summaries.aspx (last visited Mar. 17, 2018) [https://perma.cc/2AJ2-98HT] (select Pennsylvania from the drop-down menu below the map).
98. *Id.* Only $33,845,048 worth of work toward treating polluted drinking water has been completed, and an additional $19,720,151 has funding. *Id.*
99. *Id.*
100. *Id.* (select West Virginia from the drop down menu below the map).

standing liability.[101] In West Virginia, $60 million of unfunded liability for polluted drinking water still exists according to OSM's calculations, though this estimate may be conservative.[102]

TABLE 2. Current unfunded historic coal liabilities.[a]

State	Drinking water liability (billions)	Total outstanding liability (billions)	Liabilities fundend since 1977 (billions)
Wyoming	$0	$0.112	$0.506
Pennsylvania	$2.8	$3.9	$0.912
West Virginia	$0.061	$1.1	$.0764

[a] *E-AMLIS State and Tribal Summary*, *supra* note 97 (select states from drop-down menu below the map).

Meanwhile, Wyoming has zero dollars of unfunded liability for polluted drinking water.[103] In total, Wyoming only has $111 million in unfunded reclamation liability under the AML program.[104] While that amount is not insignificant, it pales in comparison to the unfunded abandoned-mine inventory of Appalachian states like Pennsylvania and West Virginia. For Appalachian communities with polluted drinking water, the unfunded reclamation liability poses a serious threat with no foreseeable funding to address the issue. Nevertheless, Wyoming continues to haul in the majority of funding from the AML program due to its current coal production.[105]

The AML Program has been unsuccessful in making significant headway toward reclaiming abandoned mine sites in Appalachia.[106] The AML Program has been in operation since 1978, yet the coal industry has only managed to generate $11 billion for the fund since then.[107] As of 2015, an estimated $9.8

101. *Id.*

102. *Id.*; Surber, *supra* note 28, at 12–13.

103. *E-AMLIS State and Tribal Summary*, *supra* note 97 (select Wyoming from the drop down menu below the map).

104. *Id.*

105. *Abandoned Mine Land Reclamation Program*, *supra* note 13.

106. *E-AMLIS State and Tribal Summary*, *supra* note 97.

107. *FY 2018 AML Grant Distribution*, *supra* note 78. To put AML Fund contributions in perspective, in 2014 alone the coal industry hauled in an estimated $46 billion in revenue. *Revenue of Coal Mining (NAICS 21211) in the United States from 2009 to 2014 (In Billion U.S. Dollars)*, STATISTA, https://www.statista.com/statistics/296501/revenue-coal-mining-in-the-us/ (last visited Jan. 22, 2019) [https://perma.cc/JT3R-RZ2R].

billion was still required to reclaim the remaining abandoned mines covered by AML.[108]

The AML program has only covered a little over half of outstanding reclamation obligations. However, because the coal market is shrinking, the industry likely will not be able to produce the same amount of reclamation funds in upcoming years as it did from 1978 to the present. The effect of the declining coal industry on the AML Program will be further discussed below. But remember, the AML Program does not apply funding toward mines in operation after 1977. Reclamation for modern coal mines is the focus of the next Section.

B. Post-1977 Mine Reclamation Funding: Performance Bonds

Turning to mines in operation after 1977, mine operators must secure reclamation bonds with the state or federal agency responsible for regulating the industry before commencing activity.[109] These bonds are used to fund mine reclamation if the mine operator fails to perform or complete the approved reclamation plan.[110] Performance requires the mine operator, referred to as the "permitee" for purposes of reclamation bonding, to reclaim the entire mine site.[111] If the mine operator fails to reclaim the entire site, then the reclamation bond is forfeited and used to fund the site's reclamation.[112]

Coal operators use three main types of reclamation bonds to comply with the requirements of SMCRA—collateral bonds, corporate surety bonds, and self-bonds.[113] To satisfy bond requirements, a regulatory agency may accept a combination of any of the permitted bond types, so long as "the total sum equals the required reclamation bond amount at all times."[114]

First, collateral bonds function as a financial guarantee by setting aside sufficient funds to cover the cost of reclamation in

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108. *Abandoned Mine Land Reclamation Program*, *supra* note 13.

109. 30 U.S.C. § 1259 (2012).

110. *Id.*

111. *Reclamation Performance Bonds*, OFFICE OF SURFACE MINING RECLAMATION & ENF'T, https://www.osmre.gov/resources/bonds/BondsOverview.shtm (last modified Apr. 24, 2017) [https://perma.cc/FBG7-GNNS].

112. *Id.*

113. *Id.*

114. *Id.*

the event that the permittee fails to perform.[115] These can take the form of "cash; certificates of deposit; first-lien interests in real estate; letters of credit; federal, state, or municipal bonds; and investment-grade securities."[116] Collateral bonds require that a line of credit exists, that sufficient cash has been set aside to cover the bond, or that the permittee has pledged sufficient assets to cover the bond.[117]

Second, a permittee may fulfill its obligation through a corporate surety bond.[118] A corporate surety bond functions as a guarantee of the permittee's performance.[119] A surety company writes the bond in exchange for a premium paid by the mine company and a promise that the mine operator will perform its reclamation obligations.[120] If the permittee fails to reclaim the site, then the surety company is required to pay the regulatory agency the bond sum.[121]

Last, a mining company may self-bond, which constitutes a corporate promise that is legally binding and available only to permittees with sufficient assets.[122] A self-bond requires no separate collateral or surety.[123] Self-bonding effectively allows a mining company to assure that it is good for the amount of the bond by demonstrating that it has a sufficient level of assets to cover the bond amount.[124] In the event that the mine operator fails to perform and reclaim the site, the only recourse exists in the mine company's own assets.[125]

For a permittee to qualify as eligible to self-bond, SMCRA requires that the company be able to demonstrate (1) a "history of financial solvency" that is sufficient to cover the bond amount required by the regulatory agency, and (2) that it has operated continuously in such standing for a minimum period

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115. *Id.*
116. *Id.*
117. *Id.*
118. *Id.*
119. *Id.*
120. Lisa A. Kirschner & Edward B. Grandy, *Mining and the Vanishing Surety Bond Market*, 17 NAT. RESOURCES & ENVT. 152, 153 (2003).
121. *Reclamation Performance Bonds*, *supra* note 111.
122. *Id.*
123. *Id.*
124. News Release, Office of Surface Mining Reclamation & Enf't, Office of Surface Mining Reclamation and Enforcement to Initiate Rulemaking on Self-Bonding for Coal Mines (Aug. 16, 2016), https://www.osmre.gov/resources/newsroom/news/2016/081616.pdf [https://perma.cc/MAZ3-8AF2].
125. *Id.*

of time.[126] The permittee's history of solvency must be sufficient to demonstrate that the coal company will remain financially viable for the period of time required for the mining operation to end and reclamation to be completed.[127] In recent years, self-bonding has become an increasingly common form of reclamation bond.

1. The Trend Toward Self-Bonding

Due to economic pressures in the early 2000s, mine operators throughout Appalachia increasingly used self-bonding in lieu of collateral or surety bonds.[128] The up-front credit or cash for collateral bonds is not easy for most coal operators to obtain.[129] Reclamation bonds are not eligible for total release until the reclamation plan has been completed.[130] Coal companies, however, generally require the upfront cash or capital for mine operations at the beginning of the mining process.[131] Because the coal operator's capital is used to carry out the mine operation, the company typically cannot afford to tie that capital up in a collateral bond that will be unavailable throughout the duration of the mine operation.[132]

Surety bonds are more desirable for coal companies than collateral bonds because they do not require the mine operator

126. 30 U.S.C. § 1259(c) (2012).

127. Policy Advisory from Joseph Pizarchik, Dir., Office of Surface Mining Reclamation & Enf't, on Self-Bonding (Aug. 5, 2016), https://www.osmre.gov/resources/bonds/DirPolicyAdvisory-SelfBond.pdf [https://perma.cc/PQA3-5YEH]. Additionally, the coal company must "maintain a tangible net worth of at least $10 million, possess fixed assets in the U.S. of at least $20 million, and either meet certain financial ratios or have an 'A' or higher bond rating." *Reclamation Performance Bonds*, *supra* note 111. For a coal company that has reorganized after bankruptcy to be eligible for self-bonding, the new company must be in operation for a period of at least five years. 30 C.F.R. § 800.23(b)(2) (2018).

128. Kirschner & Grandy, *supra* note 120, at 152. The Appalachian states with current self-bonded permits include West Virginia and Virginia, while Ohio and Pennsylvania are also among the states that allow for self-bonding. *Reclamation Performance Bonds*, *supra* note 111.

129. Kirschner & Grandy, *supra* note 120, at 153.

130. 30 U.S.C. § 1269 (2012). Note, however, that regulators may partially release bonds as phases of reclamation are completed. *Id.* After mine operators complete backfilling, regrading, or drainage control, up to 60 percent of the bond amount can be released, and another portion of the bond may be released after revegetation. *Id.* § 1269(c)(1)–(2).

131. Kirschner & Grandy, *supra* note 120, at 153.

132. *Id.*

to tie up its own capital to cover the reclamation bond.[133] But, the surety industry itself started to suffer from financial loss in the early 2000s.[134] Whereas the loss ratio for premiums in the surety industry was approximately 29 percent in 1999, the loss ratio increased significantly to 82.5 percent by 2001.[135] These substantial losses were coupled with the bankruptcy of several "high profile" surety companies, resulting in a diminished pool of surety companies overall.[136]

The withering surety industry, combined with "unique circumstances related to the extractive industry," resulted in a significant hit to the availability of surety bonds for mine operators.[137] One factor that led to hesitancy from surety companies that were considering insuring mine operations was the duration of the commitment.[138] Surety bonds work best as financial instruments for limited duration with short-term risk exposure.[139] However, the nature of risk inherent in mining activity means that reclamation bonds may be subject to long-term obligations, for example, in the event of water pollution.[140] Reclaiming polluted water requires long-term water treatment facilities and, in fact, may require treatment indefinitely.[141] Surety companies guaranteeing bonds are not well suited to sign on to this type of long-term risk.[142]

Additionally, bankruptcies in the coal sector expose surety companies to the increased possibility that the permittee will not perform its obligation to reclaim the mine site and thereby increase the chance that the surety company will forfeit its bond and incur a loss.[143] Because of the resulting instability

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133. *Id.* The premium payments owed to the surety company are typically calculated as a percentage of the bond amount, and the percentage may be set based on the fiscal strength of the coal company. *Id.*

134. *Id.* at 153–54.

135. *Id.* at 153.

136. *Id.* To compound this issue, surety companies traditionally were financially backed by reinsurance providers. *Id.* at 154. However, as the surety industry fell upon hard times, the risk-averse reinsurance providers became less interested in backing surety companies, which resulted in a further depleted total surety market. *Id.*

137. *Id.*

138. *Id.*

139. Surety companies are not thrilled to be on-the-hook for long-term liabilities. *Id.*

140. *Id.*

141. Surber, *supra* note 28, at 12.

142. Kirschner & Grandy, *supra* note 120, at 154.

143. *Id.*

and fragility of the mineral market, surety companies have been hesitant to provide financial assurances to coal companies.[144]

In sum, collateral bonds are difficult for coal operators to obtain due to a lack of surplus capital, and the absence of surety companies willing to bond coal operations has rendered surety bonds increasingly obsolete. As a result, eligible coal companies rely more heavily on self-bonds to fulfill reclamation bond obligations.[145]

2. SMCRA's Implementation: Cooperative Federalism

Under certain conditions, states can implement SMCRA, which results in varying degrees of reclamation protection among states. SMCRA allows state regulation of coal mining and reclamation as long as state laws and regulations are at least as stringent as the federal requirements.[146] For state programs to qualify for federal approval, they "must [(1)] assure that the regulatory authority will have available sufficient money to complete the reclamation plan for any areas which may be in default at any time; and (2) . . . provide a substantial economic incentive for the permittee to comply with all reclamation provisions."[147] In addition to adopting regulations necessary to carry out SMCRA's purpose,[148] OSM is also responsible for overseeing state regulatory programs implementing SMCRA.[149]

State regulatory agencies can accept self-bonds under SMCRA but may use their discretion to prohibit the self-bond option.[150] Therefore, coal companies are not automatically entitled to self-bond even if they meet all the requirements for eligibility.[151] Twenty-four states currently administer their own

144. *Id.*
145. Heard, *supra* note 44, at 211.
146. 30 U.S.C. § 1253 (2012).
147. 30 C.F.R. § 800.11(e) (2018).
148. 30 U.S.C. § 1211.
149. *Id.*
150. Policy Advisory from Joseph Pizarchik, *supra* note 127.
151. That is, self-bonding is a privilege under SMCRA, not a right. Many states have prohibited the self-bonding option. *Id.*

mining and reclamation programs.[152] Of those twenty-four, nineteen states allow self-bonds for reclamation.[153] The other five states have used their discretion to prohibit the self-bond option for permittees.[154] Self-bonds are the most risky form of reclamation assurance because of their inherent reliance on the mine company's solvency: if the mine company liquidates, so does the reclamation bond.[155] Through the flexibility in the cooperative federalism system of SMCRA, certain states, such as West Virginia, have opted for less reclamation protection, behavior that may be characterized as a race to the bottom.[156]

3. West Virginia's Alternative Reclamation Bonding System

As an example of how SMCRA's cooperative federalism structure plays out, West Virginia uses an alternative reclamation bonding system that is comprised of both performance bonds and a bond pool called the Special Reclamation Fund (SRF).[157] The SRF is responsible for covering the costs of both land and water reclamation in West Virginia until 2019.[158] A 27.9-cent fee is levied on each ton of coal produced in West Virginia for reclamation, though only 12.9 cents remain in the

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152. *Self-Bonding Facts*, OFFICE OF SURFACE MINING RECLAMATION & ENF'T, https://www.osmre.gov/resources/selfBonding.shtm (last updated Apr. 24, 2017) [https://perma.cc/E2Z6-A9C9].

153. *Id.* However, of those nineteen states, only ten currently have self-bonded surface mining permits. The states with current permits are Colorado, Illinois, Indiana, Missouri, New Mexico, North Dakota, Texas, Virginia, West Virginia, and Wyoming.

154. *See id.* States that allow for self-bonding are Alabama, Alaska, Arkansas, Colorado, Illinois, Indiana, Iowa, Louisiana, Mississippi, Missouri, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia and Wyoming. *Id.* However, Wyoming has recently considered eliminating the self-bond option. Heather Richards, *Self-Bonding May Be a Rare Occurrence for Mines Under Proposed Rules*, STAR TRIBUNE (Mar. 11, 2018), http://trib.com/business/energy/self-bonding-may-be-a-rare-occurance-for-mines-under/article_613fc986-a9d3-5c19-ba74-d98a844c8602.html [https://perma.cc/RV76-V7G6].

155. *See* Heard, *supra* note 44, at 214.

156. *See* Clark Williams-Derry, *How Coal "Self-Bonding" Puts the Public at Risk*, SIGHTLINE INST. (July 6, 2015), http://www.sightline.org/2015/07/06/how-self-bonding-puts-the-public-at-risk/ [https://perma.cc/MCP5-3LF7].

157. W. VA. CODE § 22-3-11(g) (2017).

158. *Funding*, W. VA. DEP'T ENVTL. PROT., https://dep.wv.gov/dlr/osr/Pages/Permitted-In-Stream-Treatment.aspx (last visited Mar. 19, 2018) [https://perma.cc/N9SH-TUXX]. After 2019, the Special Water Trust Fund will fund "water treatment systems on forfeited sites." *Id.*

SRF.[159] Typically, the SRF derives about 78 percent of its funding from tonnage fees on coal produced.[160] Thus, the SRF is directly funded by coal produced within the state.

When forfeited performance bonds are insufficient to reclaim a specific site, funds from the SRF are allocated to cover the remaining cost of reclamation.[161] However, the West Virginia legislature capped the performance bond amount for coal mine reclamation at $5,000 per acre.[162] This artificial cap on the cost of reclamation has resulted in a guarantee that the performance bond amount will, in fact, not be sufficient to cover the full cost of reclamation for some sites.[163] As a result, funds from the bond pool are frequently necessary to cover the cost of reclamation.[164]

Funds in the SRF bond pool, however, are insufficient to cover the cost of outstanding reclamation obligations within the state.[165] "[T]he SRF was woefully underfunded from the beginning."[166] In the 1980s, West Virginia's performance bonds only

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159. *Id.* The other 15 cents from the 27.9-cent fee go into the Water Trust Fund. *Id.* Thus, the Water Trust Fund is also driven by coal tonnage fees on coal that is produced within the state and is also inadequately funded to cover liability for water pollution within the state. *See* Surber, *supra* note 28.

160. *Funding*, *supra* note 158. The SRF also derives funds from "forfeited reclamation bonds, administrative civil penalties collected by [the Department of Environmental Protection], and interest which accrues on the amounts contributed to the SRF by the preceding three sources." Giffin, *supra* note 19, at 117.

161. W. VA. CODE § 22-3-11(g) (2017).

162. Giffin, *supra* note 19, at 118–19 ("Regardless of whether these are single or incremental in nature, West Virginia's current penal reclamation bonds may not be less than $1,000 per acre nor more than $5,000 per acre. Modifying this minimum per acre rate is West Virginia Code section 22-3-11(a) which provides that the minimum amount of a bond required for a permit must be at least $10,000. Thus, under the exception established by West Virginia Code section 22-3-11(a), if a permit is less than 10 acres in size, that permit must still feature a reclamation bond that is at least $ 10,000.").

163. *See id.* at 119.

164. Surber, *supra* note 28, at 7; Giffin, *supra* note 19, at 117 n.62 ("Realizing that even at the increased bond per acre rate a site's bond might not be sufficient to reclaim a site, the West Virginia Legislature apparently intended that the SRF make up the difference between the permitted area's bond amount and the amount it took to actually reclaim th[e] site.").

165. Surber, *supra* note 28, at 7.

166. *Id.* Now, West Virginia has a Water Fund set up to deal with water pollution from mine sites; however, that fund is also startlingly inadequate to cover the outstanding water pollution liabilities resulting from mine activity. In 2012, the West Virginia Special Reclamation Water Fund only held about $9.4 million in assets, though the estimated costs from selenium treatment alone would hover between $1.925 and $10 trillion dollars. *Id.* at 14, 24.

covered an estimated 46 percent of the total reclamation costs when bonds were forfeited.[167] By 1995, "the SRF had $62 million less than what it needed to reclaim the mine sites then covered by the SRF program."[168] In 2000, OSM found that the average reclamation bond in West Virginia was $700 per acre, but that the West Virginia Division of Mining and Reclamation, the state agency responsible for SMCRA compliance, "paid an average of nearly $3000 per acre to reclaim mine sites" that had forfeited performance bonds.[169]

This chronic underfunding violates the federal requirement that bonds sufficient to cover the full cost of reclamation exist at all times.[170] Moreover, the fact that funding for the SRF bond pool comes from fees on coal produced within the state means that catching up on the outstanding underfunded reclamation obligations will be increasingly difficult as coal production decreases or becomes less profitable in West Virginia.

Ultimately, the current mine reclamation regulatory scheme for both AML sites and sites covered by performance bonds depends upon money channeled into the reclamation system from current coal producers. In recent years, however, the coal market has been in decline. This coal market decline has affected mine reclamation framework in a variety of ways, discussed next.

III. EFFECTS OF THE DECLINING COAL INDUSTRY ON RECLAMATION PROGRAMS

Insufficient reclamation funds are the product of regulatory schemes that failed to adequately price the cost of reclamation, but they are also evidence of a withering coal industry writ large. Problematically, this decline in coal profitability threatens to further erode the effectiveness of reclamation programs. The coal industry began to decline in the 2000s, but market forces contributing to the decline have been operating

167. *Id.* at 7.
168. Giffin, *supra* note 19, at 139.
169. Surber, *supra* note 28, at 9.
170. 30 C.F.R. § 800.11(e) (2018).

for decades.[171] Factors contributing to the overall decline of coal include: "declining coal-mining productivity, shifts in global demand for coal, the shale-gas revolution which eroded coal's price advantage, the ever-increasing efficiency with which consumers use electricity, the overall flat demand in the power sector, recent cost reductions in renewable energy technology, [and] poor investments by . . . coal companies."[172] Since 2011, the coal industry's market capitalization has declined by 94 percent.[173] Coal production in 2016 was the lowest it has been in the United States since 1978, falling 17 percent from 2015.[174]

In Appalachia between 1985 and 2000, coal-mining employment dropped 60 percent even as overall coal production increased.[175] Coal mining "has the largest negative growth rate of any industry" in West Virginia.[176] In 2001 it was predicted that mineable coal in West Virginia would be depleted by 2030.[177] The profitability of Appalachian coal production is even further marginalized due to thin coal seams that have higher production costs.[178] In fact, the mining of Appalachian coal is no longer profitable because its cost of production exceeds its market value.[179]

As coal continues to diminish in prominence and profitability, the reclamation funds that depend on coal will become increasingly depleted. This dilemma is particularly acute in Appalachia where coal production is declining more rapidly

171. SUSAN F. TIERNEY, PH.D., ANALYSIS GROUP ECON. FIN. & STRATEGY CONSULTANTS, THE U.S. COAL INDUSTRY: CHALLENGING TRANSITIONS IN THE 21ST CENTURY 1 (2016).

172. *Id.* at 1. These market factors indicate that the coal industry will continue to wither, but due to the momentum behind the industry, it is not expected to disappear immediately. *Id.* at 30. Instead, it is estimated that coal will still carry about 15.4 percent of total energy production of the United States into the year 2025. *Id.* at 29.

173. *Coal May Survive, but Its Profitability Is Dead*, NASDAQ (May 9, 2016, 8:37 AM), http://www.nasdaq.com/article/coal-may-survive-but-its-profitability-is-dead-cm618047 [https://perma.cc/P5N4-Y64Z] ("Against this backdrop it is little wonder that major coal companies like Peabody have declared bankruptcy.").

174. Heard, *supra* note 44, at 211.

175. TIERNEY, *supra* note 171, at 8.

176. Webster, *supra* note 25, at 289.

177. *See id.*

178. David Roberts, *Big Coal in Big Trouble as Coal Production Costs Rise*, GRIST (Nov. 1, 2012), https://grist.org/climate-energy/big-coal-in-big-trouble-as-coal-production-costs-rise/ [https://perma.cc/GSA4-XY9B].

179. *Id.*

than coal production in other parts of the country,[180] yet Appalachia remains host to a majority of the outstanding reclamation liability.[181] The coal market decline affects both the AML program and performance bonds, but in distinct ways discussed below.

A. The Coal Market Decline and AML

The coal market's decline will increase pressure on the AML program. From its inception, the AML program has not been adequately funded to remediate the historic abandoned mine sites it was designed to address.[182] As noted above, AML has effectively reclaimed only a small fraction of historic mine sites in Appalachia and has failed to address what may be considered the most egregious by-product of unreclaimed mines—polluted water that is unfit for human consumption. For West Virginia and Pennsylvania alone there remains $2.87 billion of unfunded costs to treat polluted drinking water and $4.9 billion in total outstanding reclamation obligations for abandoned, pre-1977 sites within those states.[183] The AML fund's total unappropriated balance as of September 2017 was $2.4 billion.[184] Therefore, even if the entire unappropriated balance of the AML fund were put toward treatment of polluted drinking water in West Virginia and Pennsylvania alone, the fund would still fall short by about half a billion dollars.

The projected future of the AML program seems grim for improved reclamation success in Appalachia. Congress has allocated 60.4 percent of the current unappropriated balance of the AML fund for historic-coal-site reclamation starting in 2023. The reauthorization for AML fees expires in 2021, however, and Congress is currently considering proposals to shift fees away from AML to instead fund economic revitalization in

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180. DAN HODGE, APPALACHIAN REG'L COMM'N, APPALACHIAN COAL INDUSTRY, POWER GENERATION AND SUPPLY CHAIN 3 (2016), https://www.arc.gov/assets/research_reports/CoalIndustryPowerGenerationandSupplyChainReport.pdf [https://perma.cc/MYS3-JSU7].

181. *See supra* Section II.A.2.

182. Reid Mullen, *Statutory Complexity Disguises Agency Capture in* Citizens Coal Council v. EPA, 34 ECOLOGY L.Q. 927, 941 (2007).

183. *E-AMLIS State and Tribal Summary*, *supra* note 97 (select West Virginia and Pennsylvania from the drop down menu below the map).

184. *Abandoned Mine Land Reclamation Program*, *supra* note 13.

historic coal towns.[185] This shift is premature based on the outstanding liabilities posed by existing unreclaimed historic coal sites.

Stated bluntly, due to the coal market decline, it is impossible for coal production to generate sufficient funds for AML to cover the existing cost of historic coal-mine reclamation in Appalachia before 2021, when authorization for AML fees will expire. Although allocating 60.4 percent of the AML fund to historic coal sites is an increase from the current 30 percent allocation, historic coal sites require much larger sources of funding to complete existing remediation. Therefore, directing funds away from AML makes the task of addressing the abandoned mine sites increasingly tenuous.

Moreover, although AML was designed specifically to address unreclaimed mine sites and the accompanying environmental pollution, OSM has failed to ensure that AML funds are directed toward that purpose.[186] This misuse of funds is exacerbated by the AML distribution structure, which returns 50 percent of yearly AML contributions to each state. States that currently produce the most coal—and therefore make the largest contributions—are not necessarily the states with the largest numbers of abandoned mine sites.

For example, Wyoming is the largest coal producing state in the nation and receives the largest payouts from the AML program. Between 2013 and 2016, however, Wyoming allocated only $166 million of its AML fee distribution to coal-related reclamation projects while $214 million went to non-coal related projects throughout the state.[187] Wyoming has used money from the AML fund to "pay for highway maintenance, hospital additions, and wildlife trusts."[188]

Though funding from AML is already insufficient to cover unreclaimed historic mine sites, Congress has raided AML coffers to bailout other statutory funding shortfalls caused by the declining coal market. In 1947, the United Mine Workers of America (UMWA) Welfare and Retirement Fund (Retirement

185. *Id.*

186. Natasha Geiling, *States Are Misusing Funds Earmarked for Cleaning Up Coal Mines*, THINKPROGRESS (Apr. 4, 2017, 7:57 PM), https://thinkprogress.org/abandoned-mine-land-fund-oversight-report-bd17459d9bd4/ [https://perma.cc/GZM4-HXBS].

187. *Id.*

188. *Id.*

Fund) was formed to serve as a pension and health benefit plan for retired miners and their families.[189] Like AML, the Retirement Fund is financed through fees paid on tons of coal produced.[190] Due to the decline of the coal market and increasing insolvency of mine companies, however, coal companies began to consolidate or go bankrupt.[191] Consolidation and bankruptcies resulted in an increased financial burden on the remaining companies to finance the Retirement Fund.[192]

The Retirement Fund entitles retired miners to compensation for health care costs as they are incurred.[193] However, this system is premised on productive and solvent coal companies.[194] As the coal industry produced less revenue, new sources of funding were needed to cover miners' health care and pension costs.[195] In response, Congress passed the Coal Industry Retiree Health Benefit Act in 1992 to secure alternative funding and ensure that retired miners of bankrupt or dissolved coal companies would still receive their promised pensions and health benefits.[196] To finance the Retirement Fund with a smaller coal production pool, Congress allocated almost all of the interest earned on the AML fund to the Retirement Fund.[197]

Although retired mine workers are undoubtedly entitled to the health benefits and pensions promised to them, the AML fund was not a viable source of extra funding to choose as a bailout. As noted above, AML is deficient on its own to cover the liabilities it is designed to address. Thus, chipping away at

189. Durrie Bousacaren, *Without Congressional Action, Retired Coal Workers Could Lose Benefits by the End of the Year*, ST. LOUIS PUB. RADIO (Nov. 10, 2016), http://news.stlpublicradio.org/post/without-congressional-action-retired-coal-workers-could-lose-benefits-end-year [https://perma.cc/PL6J-2998].

190. Staci L. Smith, *Nontraditional Takings and the Coal Act*, 20 ENERGY L.J. 117, 118 (1999).

191. *Coal Act*, UNITED MINE WORKERS AM., http://umwa.org/for-members/pensions-retiree-info/coal-act/ (last visited Mar. 17, 2018) [https://perma.cc/X3RP-LZ4W].

192. *Id.*

193. Bousacaren, *supra* note 189.

194. *Id.*

195. *Coal Act*, *supra* note 191.

196. *Keeping America's Promise to Retired Coal Miners and Their Families*, AFL-CIO (Feb. 24, 2016), https://aflcio.org/about/leadership/statements/keeping-americas-promise-retired-coal-miners-and-their-families [https://perma.cc/MA5R-R2L4].

197. *Id.*; *Abandoned Mine Land Reclamation Program*, *supra* note 13.

the already slim AML fund further reduces its ability to cover the unreclaimed historic mine sites for which it was created.

To compound this issue, both the AML fund and the Retirement Fund rely on current coal production to achieve their statutory mandates.[198] This means that, in response to the declining coal industry, the viability of both funds will only continue to dwindle. Without an upsurge in coal produced and corresponding increase in fees going into the AML fund and the Retirement Fund, both programs are hard-pressed to meet existing obligations.

Furthermore, the health effects suffered by many mine workers and their families are likely to be correlated with the adverse effects of abandoned coal mines in the areas where they live or where they previously worked. As a result, carving out funds from AML to cover medical care for retired miners and their beneficiaries may only complicate the problem. By failing to reclaim mine sites—a major factor contributing to adverse health effects in Appalachia—the public health objectives of both AML and the Retirement Fund will remain jeopardized.

In sum, the effects of the declining coal industry have snowballed to the detriment of funds associated with mining. This situation has adversely affected the ability of AML to meet outstanding obligations. In parallel, the declining coal industry has also affected the viability of reclamation for current, post-1977 mine sites.

B. The Coal Market Decline and Performance Bonds

Reclamation for mines in operation after 1977 depends upon either performance by the mine operator or forfeited performance bonds to cover the price of reclamation.[199] As a general matter, if performance bonds fail to cover the full cost of reclamation, then there is no further safety net or alternative source of funding to complete reclamation for post-1977 mines.[200] When performance bonds fail, either taxpayers with-

198. 30 U.S.C. § 1232 (2012); Smith, *supra* note 190, at 118.

199. 30 U.S.C. § 1259.

200. Shea, *supra* note 32, at 211–12 ("A 1990 inventory of priority 1 and 2 abandoned mine sites estimated reclamation costs at 6 billion dollars while the AML fund generated only 3 billion dollars from 1977 through 1990."). AML was amended in 1990 so that funds could also go toward post-1977 mines that lost

in the host state bear the cost of reclamation or the environmental threats posed by unreclaimed mines remain unaddressed.[201] If state taxpayers end up shouldering the cost of mine reclamation, cleanup will undoubtedly be significantly delayed, prolonging residents' exposure to the corollary harms of unreclaimed sites.[202]

As noted earlier, coal operators have increasingly relied on self-bonding to meet performance bond requirements. Self-bonding functioned well when the coal industry was profitable, and in fact contributed to industry profitability by facilitating the liquidity of coal companies.[203] Because self-bonding did not require coal operators to tie up funds with other forms of assurance, coal companies could use that capital to "reinvest and grow."[204] However, to operate effectively, self-bonding depends on the financial stability of coal companies.

Despite coal operators increasing reliance on self-bonding—a practice premised on financial solvency—the coal market's decline resulted in the bankruptcy of several self-bonded coal giants.[205] Because of these bankruptcies, thousands of acres of heavily disturbed mine lands throughout Appalachia remain "unreclaimed with only the unenforceable promises of the self-bonded permittees serving as a backstop."[206] Throughout the coal industry, there are numerous examples of coal companies self-bonding to satisfy SMCRA requirements and

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their bonds through surety-company insolvency. *Id.* However, mines that have lost bonds due to self-bond failures cannot draw money from the AML fund to cover reclamation. *Id.* Also, West Virginia has the SRF fund, which goes to aid the price of reclaiming sites with insufficient performance bonds; however, as noted earlier, the SRF is underfunded for this function. Surber, *supra* note 28, at 9.

201. *Coal May Survive, but Its Profitability Is Dead*, *supra* note 173.

202. Sierra Club et al., *supra* note 13, at 11.

203. Heard, *supra* note 44, at 211.

204. *Id.*

205. Laura Gottesdiener, *In Appalachia, the Coal Industry Is in Collapse, but the Mountains Aren't Coming Back*, GRIST (Aug. 30, 2015), http://grist.org/business-technology/in-appalachia-the-coal-industry-is-in-collapse-but-the-mountains-arent-coming-back/ [https://perma.cc/U3WV-M6ZW]; James B. Stewart, *King Coal, Long Besieged, Is Deposed by the Market*, N.Y. TIMES (Aug. 6, 2015), https://www.nytimes.com/2015/08/07/business/energy-environment/coal-industry-wobbles-as-market-forces-slug-away.html [https://perma.cc/4DGG-59HM]; Pam Radtke Russell, *Report Recommends Tightening Self-Bonding Regulations for Coal Mining*, CQ ROLL CALL, Aug. 4, 2016 (2016 WL 4136675); Sierra Club et al., *supra* note 13, at 1.

206. Sierra Club et al., *supra* note 13, at 2.

then going bankrupt, leaving the mine sites with no money set aside for reclamation.[207]

The stories of two coal giants—Alpha Natural Resources and Peabody Energy—demonstrate this tragic situation. In 2011, Alpha Natural Resources, a publicly traded coal company, purchased the financially struggling Massey Energy for $7.1 billion.[208] This purchase bolstered Alpha's position in the coal dominion from about sixty active mines to over a hundred.[209] Alpha was the fourth-largest coal producer in the nation when it filed for bankruptcy in 2015.[210] Upon bankruptcy, Alpha held $676 million in outstanding self-bonds for coal mines.[211] Similarly, in 2016 Peabody Energy filed for bankruptcy with a self-bond obligation of $1.15 billion.[212] In 2016, OSM issued a report that calculated the total outstanding self-bond obligations nationwide at $3.86 billion.[213] Of that $3.86 billion, $2.4 billion belonged to coal companies in bankruptcy.[214] That means $2.4 billion—yes, *billion*—worth of reclamation liabilities were at risk of having no financial backing whatsoever to cover the cost of cleanup: an outrageous and jaw-dropping reality.

Although some coal companies have restructured and replaced self-bonds upon emerging from bankruptcy, there is no financial recourse for mine sites belonging to companies that fail to restructure and replace self-bonds with alternative forms of assurance.[215] Moreover, the declining market for coal consumption means that the rebound of self-bonded coal companies and subsequent restructuring is increasingly less likely to

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207. Gottesdiener, *supra* note 205; Stewart, *supra* note 205; Russell, *supra* note 205.

208. Stewart, *supra* note 205. Massey Energy was in financial distress, in part due to the much publicized Upper Big Branch Mine explosion, which resulted in the deaths of twenty-nine coal miners in 2010. Howard Berkes, *Former Massey Exec Gets 42 Months in Mine Disaster Case*, NPR (Sept. 10, 2013), https://www.npr.org/sections/thetwo-way/2013/09/10/221161240/former-massey-exec-gets-42-months-in-mine-disaster-case [https://perma.cc/5S23-Y8JB].

209. Gottesdiener, *supra* note 205; *Alpha Natural Resources and Massey Energy Agree to $8.5 Billion Combination*, BUS. WIRE (Jan. 29, 2011, 4:18 PM), https://www.businesswire.com/news/home/20110129005023/en/Alpha-Natural-Resources-Massey-Energy-Agree-8.5 [https://perma.cc/T4S4-RMYJ].

210. Stewart, *supra* note 205.

211. Russell, *supra* note 205; Heard, *supra* note 44, at 218–19.

212. Russell, *supra* note 205.

213. *Id.*

214. *Id.*

215. Heard, *supra* note 44, at 220.

occur.[216] As a result, persons living next to unreclaimed mine sites, especially in Appalachia, are more likely to have prolonged exposure to the environmental risk factors that lead to adverse health effects.[217]

For example, the SRF in West Virginia is dependent on a healthy coal industry to both contribute funds to the SRF bond pool and to produce fewer abandoned mines that require funds from the SRF for reclamation.[218] The SRF is premised on a coal industry that performs reclamation for most mine sites and relies upon SRF funds for abandoned mines only occasionally.[219] In the wake of the coal bankruptcy epidemic, however, the SRF is left in a precarious position.

In 2015 when Alpha Natural Resources declared bankruptcy, it held over $200 million in self-bonded liability in West Virginia alone, yet the SRF only contained $78.4 million at that time.[220] As a result, covering the outstanding reclamation costs for only one company, Alpha Natural Resources, could entirely deplete the SRF in West Virginia. The SRF is underfunded because of insufficient contributions by the coal industry over the past several decades.[221] Due to the diminishing profit margin of coal production, it will not be possible for states like West Virginia to generate sufficient funds to cover the outstanding reclamation liabilities within the existing structure.[222]

For both current and historic mines, reclamation programs are premised on coal production but are already behind schedule in meeting outstanding obligations. OSM failed to ensure that the coal markets accounted for total outstanding reclamation liabilities while the market was more profitable than it is today, so it is unreasonable to expect the atrophying coal market of today to be able to pick up years worth of slack. Insufficient reclamation funds create a high risk that reclamation will remain unaddressed, even though the adverse health and environmental implications associated with unreclaimed mine sites are significant. Therefore, a new system for funding mine reclamation is needed.

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216. *Id.* at 222.
217. *Id.*
218. Giffin, *supra* note 19, at 185.
219. *Id.*
220. Sierra Club et al., *supra* note 13, at 2.
221. Giffin, *supra* note 19, at 133.
222. Sierra Club et al., *supra* note 13, at 2.

IV. MOVING FORWARD WITH MINE RECLAMATION: SOME SUGGESTIONS

Market forces failed to account for the full cost of liabilities associated with coal, such as the price of reclamation.[223] This market failure has been compounded by a reclamation scheme that is entirely dependent on an ailing industry for funding. Some have characterized this failure as agency capture because programs have been designed to benefit the regulated entity at the expense of the general public.[224] Such agency capture may be inherent in a system that premises the public's interest in a clean and healthy environment upon the success of the coal industry—the coal industry's success is part and parcel of the success of the reclamation system.

As a result, viable solutions moving forward must reflect the current state of the coal industry as well as its projected continued decline. The following will first discuss suggestions for shaping current reclamation laws to better reflect this decline. Then it will discuss reclamation solutions that look beyond the coal industry for funding.

A. Fashioning Current Laws to Reflect the Coal Industry's Decline

The reclamation system was premised upon projections of an expanding and lucrative coal industry well into the future. As is now apparent, however, the coal industry will not keep up with those projections. In response, AML and performance bonds should be restructured to reflect a declining—rather than a growing—industry.

1. Suggestions for AML

Within the existing AML statutory structure, funds could be distributed in a way that better prioritizes historic abandoned mine sites. The statute currently requires 50 percent of the funds generated by each state to be returned to that state. Currently, certified states receive a 100 percent return, non-certified states receive a 50 percent return on contribution, 20

223. Mann, *supra* note 18, at 112.
224. *E.g.*, Mullen, *supra* note 182, at 931; Kaneva, *supra* note 23, at 954–55.

percent goes to federal fees, and only the remaining 30 percent funds historic coal sites. However, more than 30 percent of the remaining AML fund could be distributed to historic mine sites without the need for a statutory amendment. Additionally, fees associated with operating the AML program could be carved-out of the 50 percent returned to the states, rather than out of the portion of the fund directed toward historic mine sites. Last, interest generated by the AML fund, which is currently distributed to the UMWA Retirement Fund, could be recaptured by the AML program and used to aid the funding of historic abandoned sites.

Amending the statute so that the 50 percent of the funds generated by each state, which is currently returned to the producing state, is instead used to fund high-priority historic sites would make AML more effective for its statutory purposes. Additionally, eliminating state certification so that states without high-priority abandoned mine sites do not receive a 100 percent return on their contributions would make AML more effective. Instead, certified states could be treated like all other states within the program and receive only a 50 percent return on their contributions. Eliminating certification would allow the money that is currently used to fully refund certified states to be applied to historic mine sites. Last, amending the statute so that funds from AML can only be used for reclamation of abandoned mine sites would help achieve statutory goals.

Currently, there is a proposed bill in the Senate that would provide additional funding for abandoned mine sites on the national priority list.[225] The proposed bill would make an additional $3 billion available to supplement AML program funding for priority mine sites and provide an additional $1 billion of remediation funding for hazardous substances at abandoned mine sites.[226] If this bill were to pass, it would help significantly with the outstanding reclamation liability in Appalachia. In sum, the current AML program could be restructured to become more effective at addressing unreclaimed historic mine sites.

225. Environmental Cleanup Infrastructure Act, S. 1669, 115th Cong. § 2 (2017).

226. *Id.*

2. Suggestions for Performance Bonds

For current mine sites, the best course of action is to proactively prevent mine permittees from commencing operation with underfunded or insecure performance bonds. Two steps can bolster the strength of the existing performance bond program. First, Congress could remove the self-bond option so that mine operators are unable to avoid mine reclamation liability through bankruptcy. Currently, there is "a bill introduced to the House that proposes to amend 30 U.S.C. § 1259 to entirely disallow self-bonds from being approved and requiring all outstanding bonds to be replaced by otherwise acceptable bonds under SMCRA."[227] If passed, the bill would significantly strengthen SMCRA's existing performance bond system.[228]

Second, the performance bond amount per acre could be increased to ensure that the bond amount is sufficient to cover the entire cost of reclamation. While sufficient bonding is already supposedly required by SMCRA, programs like the West Virginia alternative bonding system demonstrate that the entire cost of reclamation is not always covered by available reclamation funds. To accomplish complete reclamation funding, either Congress or OSM could increase the federal requirements for mine reclamation bonding so that a sufficient and specific dollar amount is required per acre. Since state programs are required to be at least as stringent as the federal program under SMCRA, this proposal would prevent states from accepting bonds with a dollar amount lower than the federal floor.

B. Looking Beyond the Coal Industry to Accomplish Reclamation

Because the coal industry is rapidly shrinking, proposals that look beyond current coal companies may be the best course of action for ensuring that mine sites do, in fact, get reclaimed. Therefore, alternative sources of funding may be the best option because increased pressure on the already fragile coal industry may accelerate the industry's rate of decline, jeopardizing funding for the reclamation programs already in operation.

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227. Heard, *supra* note 44, at 233.
228. Coal Cleanup Taxpayer Protection Act, H.R. 5500, 114th Cong. (2016).

One additional source of funding for reclamation may be a tax on coal consumers rather than coal producers. For taxation, electricity consumers or coal-fired power generating stations would pay a reclamation fee on each ton of coal consumed. The benefit of moving the reclamation burden away from the coal industry is that, due to the broader tax base, the fees could be increased and distributed widely so that the burden on each entity is lessened. This proposal has the potential to alleviate the burden on the remaining coal industry so that AML and performance bond programs operate more effectively. Additionally, consumers and producers of coal-powered electricity include many more entities than the remaining coal mining companies, so the tax burden distribution could generate more reclamation funding than the current tax on coal produced by mine companies.

A second proposal for reclamation involves the use of market mechanisms to encourage business endeavors that make productive use of abandoned mines while simultaneously reclaiming the sites. As market mechanisms, tax cuts or subsidies could be provided to industries that put abandoned mine sites to profitable and beneficial uses. One example of this type of industry is the Appalachian Regional Reforestation Initiative, which is working to grow high-value hardwood trees on old mine sites, to enhance terrestrial wildlife habitats, and to lower costs associated with re-grading soils.[229] Another industry example is a research initiative that hopes to extract rare earth elements from coal and coal byproducts on abandoned mine sites.[230] Rare earth elements are used in many high-tech products, such as cell phones.[231] For reclamation purposes, the exciting component of this initiative is that through the extraction process, acid mine drainage would be treated, jobs and profits created, and abandoned sites reclaimed.[232] Because

229. *About ARRI*, OFFICE OF SURFACE MINING RECLAMATION & ENF'T, https://arri.osmre.gov/About/AboutARRI.shtm (last visited Mar. 19, 2018) [https://perma.cc/5US6-8P84].

230. West Virginia University, *Studying the Recovery of Rare Earth Elements from Coal Mining Waste*, SCIENCEDAILY (Dec. 15, 2015), https://www.sciencedaily.com/releases/2015/12/151215122843.htm [https://perma.cc/8KV7-X3YE].

231. Jessica Moore, W. Va. Geological & Econ. Survey, Characterization of Rare Earth Elements in WV Coal Measures, Presentation at the West Virginia Governor's Energy Summit 11 (Oct. 6, 2016), http://energywv.org/assets/files/Energy-Summit-Presentations/2016/9_MOORE.pdf [https://perma.cc/L7YY-ETHR].

232. West Virginia University, *supra* note 230.

these industries are synergistic with reclamation efforts, market mechanisms should encourage these endeavors on abandoned mine sites.

Moving forward, mine reclamation requires a system that accounts for the decline in coal production and profitability. Such a system may involve restructuring existing reclamation programs, looking beyond the coal industry to cover reclamation costs, or both. Although equitable sensibilities may drive critics to argue for increased strictures on the remaining coal industry for reclamation funding, this may no longer be an economically viable option. Existing market forces are operating independently to push the coal industry toward implosion without additional reclamation burdens. Moreover, the nation has reaped the benefits of heavily subsidized coal for decades at the expense of many communities in the Appalachian coal fields.[233] As such, it is equitable to look toward revenue sources or reclamation opportunities outside the coal industry to cover unreclaimed environmental liabilities. Moving forward with legacy environmental obligations will require creative, collaborative, and proactive solutions.

CONCLUSION

There is still a lot of work left to do in Appalachia to restore land and water affected by coal mining. Otherwise, Appalachians living in poverty will continue to drink polluted water, get sick, and suffer other adverse effects from living near environmentally degraded waterways and land. The funds derived from coal production to date have not made significant progress toward current reclamation obligations. As the coal industry continues to decline, fulfilling outstanding environmental obligations will only become more tenuous under the existing regulatory structure. To meet the statutory objectives of SMCRA, new sources of funding need to be developed so that mine reclamation can continue to completion. Throughout Appalachia, communities are well aware of the decline in livelihood that accompanies King Coal's departure as mines close and paychecks evaporate. Now, environmentalists need to con-

233. David Robert, *Friendly Policies Keep US Oil and Coal Afloat Far More Than We Thought*, VOX (Oct. 7, 2017), https://www.vox.com/energy-and-environment/2017/10/6/16428458/us-energy-subsidies [https://perma.cc/W8QY-Y67G].

sider the legacy reclamation obligations that may be left without adequate funding as King Coal falls from his throne.

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